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29 October 1998 (29.10.98)

(54) Title: UNIQUE DENDRITIC CELL–ASSOCIATED C–TYPE LECTINS, DECTIN–1 AND DECTIN–2; COMPOSITIONS AND USES THEREOF

(57) Abstract

Novel genes expressed selectively by long–term dendritic cell (DC) lines (XS series) from murine epidermis which retain important features of resident epidermal Langerhans cells (LC) are provided. These genes encode distinct type II membrane–integrated polypeptides, each consisting of a cytoplasmic domain, a transmembrane domain, an extracellular connecting domain, and a C–terminal extracellular domain that exhibits significant homology to the carbohydrate recognition domains (CRD) of C–type lectins. Expression of both genes is highly restricted to cells of DC lineage (including epidermal LC). Thus, these genes encode new, DC–specific members of the C–type lectin family, now termed "DC–associated C–type lectin–1 and –2" (dectin–1 and dectin–2). Two isoforms of the dectin–1 molecule and five isoforms of the dectin–2 molecule have also been identified. The invention further provides His–tagged fusion proteins comprising 6x histidine and the extracellular domain of dectin–1 or dectin–2. Also provided are antibodies raised to synthetic peptides designed from the dectin–1 sequence or to the His–tagged fusion proteins described.

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INTERNATIONAL SEARCH REPORT

Interna[illegible]al Application No
PCT/US 97/23761

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 C12N15/12 C12N1/21 C12N5/16 C12Q1/68 C07K14/47
C07K14/705 C07K16/18 A61K48/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 C12N C12Q C07K A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	WO 98 02456 A (INCYTE PHARMA INC ;AU YOUNG JANICE (US); COCKS BENJAMIN GRAEME (US) 22 January 1998 see the whole document ---	1,2,5,6, 38,39, 42, 45-60, 90-96, 98,99, 103
X	WO 96 23882 A (UNIV ROCKEFELLER ;STEINMAN RALPH M (US); NUSSENZWEIG MICHEL C (US)) 8 August 1996 see the whole document ---	1,2,5,6, 38,39, 42, 45-60, 90-96, 98,99, 103

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
21 April 1998	08. 09. 98

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Hillenbrand, G

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Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

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PCT/US 97/23761

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	SUZUKI N ET AL: "MOLECULAR CLONING AND EXPRESSION OF CDNA ENCODING HUMAN MACROPHAGE C-TYPE LECTIN" JOURNAL OF IMMUNOLOGY, vol. 156, no. 1, 1 January 1996, pages 128-135, XP002046614 see the whole document ---	1,2,5,6, 38,39, 42, 45-60, 90-96, 98,99, 103
X	*ARIIZUMI K ET AL: "Cloning of novel C-type *lectins* that are expressed selectively by dendritic cells" JOURNAL OF INVESTIGATIVE DERMATOLOGY, 106 (4). 1996. 814., XP002062819 see the whole document -----	1,2,5,6, 38,39, 42, 45-60, 90-96, 98,99, 103

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 97/ 23761

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.: X
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
See attached sheet

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See attached sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Claims 1 - 60, 90 - 103

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/ US 97/23761

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: 1-60, 90-103

This group of claims is directed to a DNA segment encoding a dectin-1 or dectin-2 polypeptide, a recombinant host cell comprising such a DNA segement, a composition comprising a purified dectin-1 or dectin-2 polypeptide, a fusion protein comprising such polypeptides, and an antibody that is reactive with these dectin-1 or dectin-2 polypeptides.

2. Claims: 61-68

This group of claims is directed to a nucleic acid segment having no defined functional properties.

3. Claims: 69-71

This group of claims is directed to a dectin-like gene.

4. Claims: 72-89

This group of claims is directed to a method of identifying a human nucleic acid segment that comprises an isolated coding region that encodes a human dectin-like polypeptide.

5. Claims: 104-108

This group of claims is directed to a method for inhibiting the interaction of DC with a T cell.

6. Claims: 109-112

This group of claims is directed to a method of treating inflammation.

7. Claims: 113-122

This group of claims is directed to a method for identifiying an effector of DC interaction with T cells.

8. Claim : 123

This group is directed to a method for identiying an inhibitory agent.

9. Claim : 127

This group is directed to a method for purifying T cells.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/ US 97/23761

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

10. Claim : 128

This group is directed to a method for identifying a stimulatory agent.

11. Claim : 132

This group is directed to a method of engineering a DC that does not express dectin-1 or dectin-2.

12. Claims: 133-136

This group of claims is directed to a method for targeting gene expression in a cell.

13. Claims: 137-140, 148-151

This group of claims is directed to a DNA segment comprising a dectin promoter element and a pharmaceutical composition comprising such a promoter element.

14. Claim : 141

This group is directed to a method of suppressing the expression of a dectin-1 or dectin-2 gene in a cell.

15. Claim : 143

This group is directed to a method of producing a transgenic animal.

16. Claim : 146

This group is directed to a method for identifying a ligand of dectin-1 or dectin-2.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/ US 97/23761

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This international search report has not been established in respect of certain claims for the following reasons:

Claims Nos.: 13,124-126,129-131,142,144-145,147

because they relate to parts of the international application that do not comply with the prescribed requirements to such an extend that no meaningful international search can be carried out, specifically:

The content of said claims is so obscure that no meaningful search can be carried out.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern ..al Application No
PCT/US 97/23761

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9802456 A	22-01-1998	AU 3665097 A	09-02-1998
WO 9623882 A	08-08-1996	AU 4970296 A	21-08-1996
		CA 2211993 A	08-08-1996
		EP 0808366 A	26-11-1997